AMENDMENTS TO THE CLAIMS

What is Claimed:

1. (Original) A device for handling a fluid comprising:

a corona discharge device including at least one corona discharge electrode and at least one collector electrode; and

an electric power supply connected to said corona discharge and collector electrodes to supply an electric power signal by applying a voltage V_t between said electrodes so as to cause a corona current I_t to flow between said corona discharge and collector electrodes, both said voltage V_t and corona current I_t each being a sum of respective constant d.c. and alternating a.c. components superimposed on each other whereby $V_t = V_{d.c.} + V_{a.c.}$ and $I_t = I_{d.c.} + I_{a.c.}$, a current ripple value $I_{a.c.}/I_{d.c.}$ related to a voltage ripple value $V_{a.c.}/V_{d.c.}$ as

$$\frac{I_{a.c.}}{I_{d.c.}} = \frac{C \cdot V_{a.c.}}{V_{d.c.}}$$

wherein $C \geq 2$.

2. (Original) The device according to claim 1 wherein $C \geq 10$.

3. (Original) The device according to claim 1 wherein $C \geq 100$.

4. (Original) The device according to claim 1 wherein $C \geq 1000$.

5. (Original) The device according to claim 1 wherein a frequency of said alternating component of said voltage $V_{a.c.}$ has a main frequency well in excess of an audible sound level.

6. (Original) The device according to claim 1 wherein a frequency of said alternating component of said voltage $V_{a.c.}$ is in a range above 30 kHz.

7. (Original) The device according to claim 1 wherein a frequency of said alternating component of said voltage $V_{a.c.}$ is in a range *of 50 kHz to 1 MHz.*

8. (Original) The device according to claim 1 wherein a frequency of said alternating component of said voltage $V_{a.c.}$ is approximately 100 kHz.

9. (Original) The device according to claim 1 wherein said amplitude of said constant component of said voltage of said electric power signal is within a range of 10 kV to 25 kV.

10. (Original) The device according to claim 1 wherein said amplitude of said constant component of said voltage $V_{d.c.}$ is greater than 1 kV.

11. (Original) The device according to claim 1 wherein said amplitude of said constant component of said voltage $V_{d.c.}$ of said electric power signal is approximately 18 kV.

12. (Original) The device according to claim 1 wherein:

said amplitude of said alternating component of said corona current $I_{a.c.}$ of said electric power signal is no more than 10 times greater than said amplitude of said constant current component $I_{d.c.}$ of said electric power signal; and

said amplitude of said constant current component $I_{d.c.}$ of said electric power signal is no more than 10 times greater than said amplitude of said alternating component $I_{a.c.}$ of said corona current of said electric power signal.

13. (Original) The device according to claim 1 wherein said amplitude of an alternating component of said voltage $V_{a.c}$. of said electric power signal is no greater than one-tenth of said amplitude of said constant component of said voltage $V_{d.c.}$.

14. (Original) The device according to claim 1 wherein said amplitude of said alternating component of said voltage of said electric power signal $V_{a.c.}$ is no more than 1 kV.

15. (Original) The device according to claim 1 wherein said constant component of said corona current $I_{d.c.}$ is at least 100 μA.

16. (Original) The device according to claim 1 wherein said constant component of said corona current $I_{d.c.}$ is at least 1 mA.

17. (Original) The device according to claim 1 wherein a reactive capacitance between said corona discharge electrodes has a capacitive impedance that corresponds a highest harmonic of a frequency of said alternating component of said voltage that is no greater than 10 MΩ.

18. (Original) The device according to claim 1 wherein the potential of the corona electrode is close to a ground potential.

19. (Original) The device according to claim 18 wherein the potential of the corona discharge electrode is within ± 50 V of said ground potential.

20. (Original) The device according to claim 1 wherein the potential of the collecting electrode is close to a ground potential.

21. (Original) The device according to claim 20 wherein the potential of the collecting electrode is within ± 50 V of said ground potential.

22. (Original) The device according to claim 1 wherein the potential of neither said corona discharge electrode nor said collecting electrode is close to a ground potential.

23. (Original) The device according to claim 22 wherein the potentials of both said corona discharge electrode and said collecting electrode are at least 10 V different from said ground potential.

24. (Original) The device according to claim 23 wherein the potentials of both said corona discharge electrode and said collecting electrode are at least 50 V different from said ground potential.

25. (Original) A device for handling a fluid comprising:

a corona discharge device including at least one corona discharge electrode and at least one collector electrode; and

an electric power supply connected to said corona discharge and collector electrodes to supply an electric power signal by applying a voltage V_t between said electrodes so as to cause a corona current I_t to flow between said corona discharge and collector electrodes, both said voltage V_t and corona current I_t each being a sum of respective constant d.c. and alternating a.c. components superimposed on each other whereby $V_t = V_{d.c.} + V_{a.c.}$ and $I_t = I_{d.c.} + I_{a.c.}$, wherein $V_{a.c.} << V_{d.c.}$ and $I_{a.c.} \sim I_{d.c.}$.

26. (Original) A device for handling a fluid comprising:

a corona discharge device including at least one corona discharge electrode and at least one collector electrode; and

an electric power supply connected to said corona discharge and collector electrodes to supply an electric power signal by applying a voltage V_t between said electrodes so as to cause a corona current I_t to flow between said corona discharge and collector electrodes, both said voltage V_t and corona current I_t each being a sum of respective constant d.c. and alternating a.c. components superimposed on each other whereby $V_t = V_{d.c.} + V_{a.c.}$ and $I_t = I_{d.c.} + I_{a.c.}$, wherein $V_{a.c.} < V_{d.c.}$ and $I_{a.c.} > I_{d.c.}$.

27. (withdrawn)

28. (Original) A method of handling a fluid comprising:

introducing the fluid to a corona discharge device including at least one corona discharge electrode and at least one collector electrode positioned proximate said corona discharge electrode so as to provide a total inter-electrode capacitance within a predetermined range; and

supplying an electric power signal to said corona discharge device by applying a voltage V_t between said corona discharge and collector electrodes so as to induce a corona current I_t to flow between said electrodes, both said voltage V_t and corona current I_t each being a sum of respective constant d.c. and alternating a.c. components superimposed on each other whereby V_t

$= V_{d.c.} + V_{a.c.}$ and $I_t = I_{d.c.} + I_{a.c.}$, a current ripple value $I_{a.c.}/I_{d.c.}$ related to a voltage ripple value $V_{a.c.}/V_{d.c.}$ as

$$\frac{I_{a.c.}}{I_{d.c.}} = \frac{C \cdot V_{a.c.}}{V_{d.c.}}$$

wherein $C \geq 2$.

29. (Currently Amended) The ~~device~~ method according to claim 28 wherein $C \geq 10$.

30. (Currently Amended) The ~~device~~ method according to claim 28 wherein $C \geq 100$.

31. (Currently Amended) The ~~device~~ method according to claim 28 wherein $C \geq 1000$.

32. (Original) The method according to claim 28 further comprising a step of supplying said power signal to have and alternating component of said voltage $V_{a.c.}$ with a main frequency well in excess of an audible sound level

33. (Original) The method according to claim 28 further comprising a step of supplying said power signal to have a frequency of said alternating component of said corona current is in the range above 30 kHz.

34. (Original) The method according to claim 28 wherein a frequency of said alternating component of said voltage is in a range of 50 kHz to 1 MHz.

35. (Original) The method according to claim 28 wherein a frequency of said alternating component of said voltage is approximately 100 kHz.

36. (Original) The method according to claim 28 wherein said amplitude of said constant component of said voltage $V_{d.c.}$ is within a range of 10 kV to 25 kV.

37. (Original) The method according to claim 28 wherein said amplitude of said constant component of said voltage $V_{d.c.}$ is greater than 1 kV.

38. (Original) The method according to claim 28 wherein said amplitude of said constant component of said voltage $V_{d.c.}$ is approximately 18 kV.

39. (Original) The method according to claim 28 wherein:

said amplitude of said alternating component of said corona current $I_{a.c.}$ is no more than 10 times greater than said amplitude of said constant component of said corona current $I_{d.c.}$; and

said amplitude of said constant component of said corona current $I_{d.c.}$ is no more than 10 times greater than said amplitude of said alternating component of said corona current $I_{a.c.}$.

40. (Original) The method according to claim 28 wherein said amplitude of said alternating component of said voltage $V_{a.c.}$ is no greater than one-tenth of said amplitude of said constant component of said voltage $V_{d.c.}$.

41. (Original) The method according to claim 28 wherein said amplitude of said alternating component of said voltage $V_{a.c.}$ of said electric power signal is no greater than 1 kV.

42. (Original) The method according to claim 28 wherein said constant component of said corona current $I_{d.c.}$ is at least 100 μA.

43. (Original) The method according to claim 28 wherein said constant component of said corona current $I_{d.c.}$ is at least 1 mA.

44. (Original) The method according to claim 28 wherein a reactive capacitance between said corona discharge electrodes and said collector electrodes has a capacitive impedance that corresponds to a highest harmonic of a frequency of said alternating component of said voltage and is no greater than 10 MΩ.

45. (Original) A method of handling a fluid comprising:

introducing the fluid to a corona discharge device including at least one corona discharge electrode and at least one collector electrode positioned proximate said corona discharge electrode so as to provide a total inter-electrode capacitance within a predetermined range; and

supplying an electric power signal to said corona discharge device by applying a voltage V_t between said corona discharge and collector electrodes so as to induce a corona current I_t to flow between said electrodes, both said voltage V_t and corona current I_t each being a sum of respective constant d.c. and alternating a.c. components superimposed on each other whereby $V_t = V_{d.c.} + V_{a.c.}$ and $I_t = I_{d.c.} + I_{a.c.}$, and wherein $V_{a.c.} << V_{d.c.}$ and $I_{a.c.} \sim I_{d.c.}$.

46. (Original) A method of handling a fluid comprising:

introducing the fluid to a corona discharge device including at least one corona discharge electrode and at least one collector electrode positioned proximate said corona discharge electrode so as to provide a total inter-electrode capacitance within a predetermined range; and

supplying an electric power signal to said corona discharge device by applying a voltage V_t between said corona discharge and collector electrodes so as to induce a corona current I_t to flow between said electrodes, both said voltage V_t and corona current I_t each being a sum of respective constant d.c. and alternating a.c. components superimposed on each other whereby $V_t = V_{d.c.} + V_{a.c.}$ and $I_t = I_{d.c.} + I_{a.c.}$, and wherein $V_{a.c.} < V_{d.c.}$ and $I_{a.c.} > I_{d.c.}$.

47. (Withdrawn).